



Reviving the 2068 Keyboard

One of the complaints most often heard about the Timex 2068 and its keyboard is the "dead" keys and/or spacebar that so often develops. Here is a procedure that will often solve the problem.

An understanding of how the 2068 keyboard is made reveals the solution. The accompanying photo shows the constituent parts. When viewing the 2068 only the overlay and the keys are visible. In fact, under the overlay is a hard plastic sheet with all the keys mounted through it. Under this sheet is a rubber membrane with

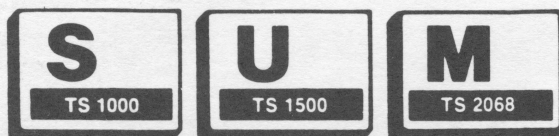
a convex "bubble" formed precisely under each key in the layer above it. Mounted to the underside of each bubble or dome is a small conductive button. The bottom layer of the keyboard consists of the printed circuit board laid out as a matrix. Consulting a circuit diagram of the 2068 shows that the computer reads the keyboard by checking each vertical and horizontal line on the circuit board for a completed circuit. A closed circuit is made as the key presses the dome which presses the

...continued on page 8

Gainesville TUG Meetings

The Gainesville Timex Users Group has changed its meeting time and place. Meetings are now the third **Tuesday** of each month in the northeast classroom area of the **Crossroads Church** building located at 2720 SW Second Avenue in Gainesville. Meeting time is still 7:00 p.m. These facilities are somewhat larger than what we have used in the past and can accommodate a number of computer set-ups.

Anyone needing more information about the next meeting can call Joe Williamson at 904/462-1086 or Richard Cravy at 904/378-9000.



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BACK ISSUES OF SUM AVAILABLE

The following back issues of **SUM Magazine** are available for purchase while the supply lasts. Back issues before this are no longer available except on a more expensive "photocopied" basis. To order, use or make a copy of the order form inside the back cover of this issue, check the appropriate square(s) and mail with a check to the address listed there. By popular request we have listed a **partial** "Table of Contents" for each issue.

January, 1985 — TS-2068 Printer Interface Hardware Project; Beginner's Programming, Part I; Sears RGB Monitor with TS-2068; More on Spectrum software running on modified TS-2068. 10 pages.

February, 1985 — February Vendor Report; TS-2068 Printer Interface, Part II; Beginner's Programming, Part II; Tasword II Improvements. 12 pages.

March, 1985 — Spectrum Plus Now in U.S.; TS-2068 Printer Interface, Part III; A & J Microdrive Review; SPECTAX85 Review; Beginner's Programming, Part III. 16 pages.

April, 1985 — Timex Portugal Coming; ZX Microdrive Interface for 2068 Announced by EMC; Tasword II on the A & J Microdrive; User-Defined Graphics for the TS-1000, Part I; Beginner's Programming, Part IV; Rocket Man Review; Using Aerco Interface with Spectrum Rom. 16 pages.

May, 1985 Special Issue — Publisher's Statement; Portuguese 2068 Computer and Disk Drive System Hands-On Evaluation; Rotronics Wafadrive Review; Convert Your TV into a Monitor; Pro/File 2068 Review; Zaxxon Review; User-Defined Graphics for the TS-1000, Concluded. 28 pages.

June, 1985 — The Consumer Electronics Show; 2068 Graphics Primer; Spectrum Plus Review; Keyboard Template for Tasword II Users. 20 pages.

ASTRONOMY PROGRAMS (TS-2068): for astronomers, navigators, science classes, etc. Compute positions of Sun, Moon, & planets for any date; find dates & times of moon phases, solar & lunar eclipses; sunrise/sunset times; equinoxes/solstices (seasons); Julian Day & sidereal time, & 10000 year calendar. Complete set (tape & manual): \$14.95



I. Auersbacher
41 King Street A2
Belleville, NJ 07109

The Computer Shopper Magazine

One of my favorite magazines, next to SUM Magazine, is the COMPUTER SHOPPER from Titusville, Florida. With an annual subscription rate of \$15.00 and a monthly size of over 200 pages tabloid size, it has to be a great value. The SHOPPER is stuffed full of discount mail-order ads and 20 or so pages of classifieds. It is one publication that I read practically from cover to cover the articles by Stan Veit, Don Lancaster, Les Solomon and a host of lesser known writers who have fresh and interesting reviews and how-to articles for the general user as well as "survival columns" for the Timex, TI-99/4, Sanyo, Tandy, Atari, and CP/M computers.

With the whole computer market seeming to be going to IBM and Commodore, it is great to find a publisher who recognizes the continuing needs of these other owners. The Timex column is written by Mark Fendrick, who I do not know, but who has attempted to inform CS readers of the great potential for their machines with articles on Spectrum ROMs, microdrives, new software, and the Portuguese disk drive system.

But even without the Timex column, I would studiously read each issue because of the great bargains available in its pages which, alas, my bank account seldom can take advantage of...but that doesn't stop me from wishing! Let me give you a few examples from the most recent issue (August 1985):

Thinking of moving up to a "big" computer but want a bargain price? Solvex Marketing is selling brand new Sanyo MBC 3000 computers with built-in monitor, detached keyboard, two disk drives, Wordstar, Calcstar, etc., and CP/M 2.2--all for an incredible \$599 on page 32.

CP/M not big enough? Then perhaps the NCR PC1 with IBM compatibility, 256K, two disk drives, and MS-DOS 2.11 for \$1295 from Computrade (page 88) is what you are looking for.

Anyone want a leading brand RGB monitor for \$269? Thrifty Bits (page 94) has the 14" Leading Edge RGB monitor with 16 color output and 80 column by 25 line text display ability.

Maybe you need a printer. How about an



Okimate 20 with parallel interface for \$199 (p. 134); a Comrex CR-IIE 20 cps daisy wheel printer for \$266 (p. 135); a 3M Whisperwriter 200 thermal printer for \$79.95 (p. 159); or even a Corona Laser Printer for \$2699 (p. 16).

Still more "good deals"? An NEC 8201 portable computer (Radio Shack 100 look-alike) for \$348 (p. 160) sounds good. How about an Epson QX 10 for \$999 (p. 182). Have a thermal 80 column printer or typewriter? Here's 8 1/2 x 11 thermal paper for \$2.99 per package of 500 (p. 127).

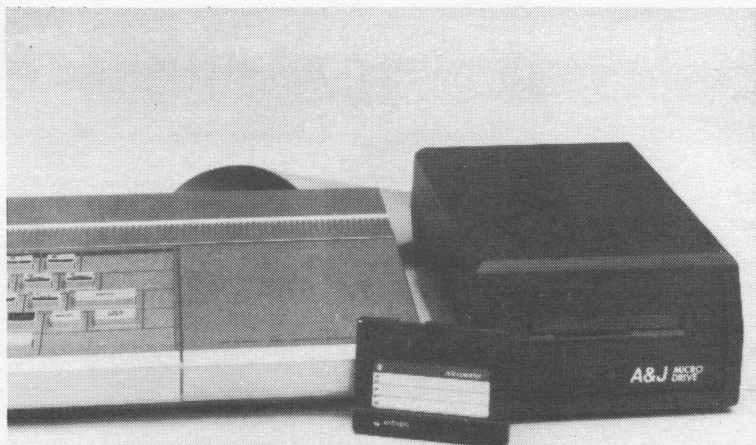
I think this is enough to give you some idea of what all I can't afford to buy but wish I could from Computer Shopper advertisers. I highly recommend everyone who loves computers to subscribe, or at least pick up a copy from your local magazine rack. I have found copies at B. Dalton's, Walden's, and Albertsons. Computer Shopper, P. O. Box F, Titusville, FL 32781. Subscriptions are \$15/year.

-- Richard Cravy

Tell them you saw it in SUM

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Hi-Res Graphics for the TS-1000

A Review of I.S.I.'s Software

"High Resolution Graphics MK. II" is a software high resolution graphics program for the TS-1000 line of computers. It has the ability to plot points, unplot points, write in upper and lower case, test a point on the screen, invert the hi-res screen, and copy the hi-res screen to the printer. The resolution comes as 192 X 128 but can be expanded up to 192 X 256 in some applications.

The program auto-runs after loading and gives you an example of hi-res with both upper and lower case text telling where the addresses are for each operation. You use RAND USR XXX in your program each time you wish to access a function. Each function is easy to use and examples are given.

Included in the documentation is a short program which will allow you to draw on the screen using the arrow keys (see example), and a test program for writing in upper and lower case.

As an example, to use upper and lower case, you must first clear the hi-res screen using RAND USR 16572, call the hi-res routine with RAND USR 16514, place in a PRINT statement what you wish to print in upper and lower case (using inverse characters for upper case), POKE 16417 with the line you wish it to appear in, and call the print routine with RAND USR 17285.

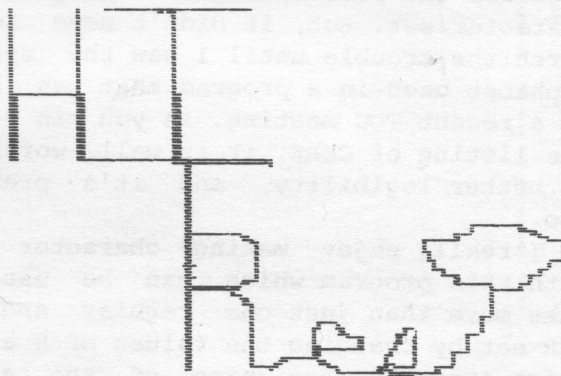
The characters are not the best in the world; I like the upper and lower case letters on the 2068 much better. If I knew where the character table started, it would be easy to change to a more pleasing character set.

HIGH RESOLUTION GRAPHICS PROGRAM

Version 2
(C) 1984 by Craig Bird

```
16514-Goto high res screen
16562-Return to Sinclair display
16572-Clear high-res display
16584-Plot a point
16598-Unplot a point
16602-Test a point
17285-U/L case printer
17572-Print out high-res screen
17600-Invert high-res screen
```

Lines 20 to 320 may be removed



This is a Test of HIRES Graphics

Another thing that isn't explained in the manual is that you must be in SLOW mode in order to see what is being printed. The plot routines are much quicker than the Sinclair plot.

The code is short and only takes about a minute to load. I am very happy with this program. It does a lot and is easy to use. Best of all it is inexpensive. They also list a word processor using the hi-res routines which should be pretty good from what I've seen here. They state in several places that it only works with the TS-1000 and ZX81, but it loaded and ran fine on my TS-1500 as well.

Available from: Inter-Pacific Systems Inc. 3770 Duke Rd, RR #1, Victoria, BC, Canada V8X 3W9. \$7.49 (US).

-- Joe Williamson

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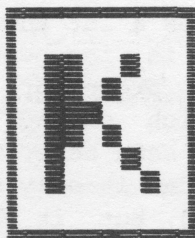
3708 Newberry Road — Gainesville, FL 32607
904/373-6796

Creating Your Own TS-2068 Character Set

One of the features that made me get my 2068 was the possibility of changing the character set. But, it didn't seem to be worth the trouble until I saw the special alphabet used in a program that was shown at a recent TUG meeting. As you can see in the listing of CHR\$, it is well worth it in better legibility, and it's prettier too.

I really enjoy making character sets with this program which can be used to make more than just one regular and one USR set by changing the values of S and T which are the beginning of the second character set and UDG set respectively.

After you type in the program and RUN it you can start out by copying the Sinclair character set and then changing it. Sets can also be saved as bytes for use in other programs. Line 6000 switches the computer back into the normal ROM characters while line 6010 puts the new ones into use.



arrow keys █:1 :0 ENTER ESC:4

The character editor routine is entered by pressing a character you wish to change. While in the edit mode, use the arrow keys to move the dots around. Press 1 to plot, press 0 to unplot, press 4 to return to the menu, and press enter to POKE the new character.

I don't think you will ever be content with just the old alphabet again.

-- John Monkus

```
10 REM CHR$
20 REM 6-26-85
22 REM BY JOHN MONKUS
30 DIM A(8): RESTORE : FOR I=1
TO 8: READ A(I): NEXT I
32 DATA 128,64,32,16,8,4,2,1
40 LET S=64600: LET T=65368: L
ET U=1
100 GO TO 1790
600 GO SUB 950: LET H=T+8*(CHR-
144): GO TO 710
```

```
700 GO SUB 950: LET H=S+8*(CHR-
32)
710 FOR I=1 TO 8: LET HH=PEEK (
H+I-1)
712 FOR J=1 TO 8
720 IF HH>A(J) THEN LET HH=HH-
A(J): LET S$(I,J)="█"
730 NEXT J: NEXT I
790 GO TO 2000
950 DIM S$(8,8): FOR I=1 TO 8:
LET S$(I)="" : NEXT I: RE
TURN
960 PRINT AT 14,12: FLASH 1:"█
█: FOR I=0 TO 767: POKE (S
+I),PEEK (15616+I): NEXT I: LET
U=0: GO TO 1800
999 ON ERR RESET : OVER 0: BEEP
0.07,31: BEEP 0.07,28: PAPER 7:
INK 9: BRIGHT 0: BORDER 6: STOP

1010 PRINT AT Y+3,X+7;S$(Y,X): R
ETURN
1800 ON ERR RESET : BORDER 1: PA
PER 1: INK 9: CLS : POKE 23658,1
1810 PRINT AT 5,0: GO SUB 5500:
1820 PRINT AT 19,2:"█:copy Sincl
air set "" "" :stop":AT 21,4:"█:l
oad CHR$ =:save CHR$"
1840 DIM C$(1): INPUT ;TAB 10;"C
HARACTER?";C$
1842 IF C$="" THEN GO TO 7000
1844 IF C$="" THEN IF U=1 THEN
GO TO 960
1846 IF C$="" THEN GO TO 7100
1848 IF C$="" THEN COPY
1850 IF C$="" OR C$="" THEN GO
TO 999
1860 LET CHR=CODE C$
1870 IF CHR>143 AND CHR<165 THEN
GO TO 600
1880 IF CHR>32 AND CHR<127 THEN
GO TO 700
1900 GO TO 1800
2000 OVER 0: BORDER 6: PAPER 6:
BRIGHT 0: CLS : INK 9: PAPER 8:
PRINT AT 3,7:"█: FOR I
=1 TO 8: PRINT AT I+3,7;"█: PAP
ER 7;S$(I): PAPER 8:"█: NEXT I:
PRINT AT 12,7:"█
2010 POKE 23658,8: GO SUB 3000:
GO SUB 5000
2200 PRINT AT 14,0: PAPER 6:"arr
ow keys █:1 "; PAPER 7:" "; PAPE
R 6:" :0 ENTER ESC:4 ": LET X=
4: LET Y=4
2210 PRINT AT Y+3,X+7: BRIGHT 1:
INVERSE 1;S$(Y,X)
2230 IF INKEY$="5" THEN : IF X>1
THEN GO SUB 1000: LET X=X-1:
2240 IF INKEY$="8" THEN : IF X<8
THEN GO SUB 1000: LET X=X+1:
2250 IF INKEY$="7" THEN : IF Y>1
THEN GO SUB 1000: LET Y=Y-1:
2260 IF INKEY$="6" THEN : IF Y<8
THEN GO SUB 1000: LET Y=Y+1
2300 IF INKEY$="0" THEN : BEEP 0
.02,44: LET S$(Y,X)="" : PRINT A
T Y+3,X+7;S$(Y,X): GO SUB 3890:
PLOT INVERSE 1;171+X,88-Y: PLOT
187+X,88-Y
```



```

2310 IF INKEY$="1" THEN : BEEP 0
.04,32: LET S$(Y,X)="█": PRINT A
T Y+3,X+7;S$(Y,X): GO SUB 3890:
PLOT 171+X,88-Y: PLOT INVERSE 1;
187+X,88-Y
2350 PRINT AT Y+3,X+7;S$(Y,X)
2370 IF INKEY$="B" THEN : GO SUB
950: GO TO 2000
2380 IF INKEY$="4" THEN : GO TO
1800
2390 IF INKEY$=CHR$ 13 THEN BEEP
0.3,21: GO TO 4000
2410 GO TO 2210
3000 REM SMALL PRINT
3010 FOR I=6 TO 9: PRINT AT I,21
: PAPER 7;" " : NEXT I
3020 PLOT 164,130: DRAW 38,0: DR
AW 0,-37: DRAW -38,0: DRAW 0,38:
DRAW 39,0: DRAW 0,-39: DRAW -40
,0: DRAW 0,39
3030 FOR K=1 TO 8 STEP 2: FOR L=
1 TO 8 STEP 2:
3040 GO SUB 3910: NEXT L: NEXT K
3090 RETURN
3890 IF Y/2=INT (Y/2) THEN LET K
=Y-1
3892 IF Y/2<>INT (Y/2) THEN LET
K=Y
3894 IF X/2=INT (X/2) THEN LET L
=X-1
3896 IF X/2<>INT (X/2) THEN LET
L=X
3900 PRINT AT 5+(K+1)/2,20+(L+1)
/2: OVER 0;" "
3910 IF S$(K,L)="█" THEN PRINT A
T 5+(K+1)/2,20+(L+1)/2: OVER 1;"
"
3920 IF S$(K+1,L)="█" THEN PRINT
AT 5+(K+1)/2,20+(L+1)/2: OVER 1
;" "
3930 IF S$(K,L+1)="█" THEN PRINT
AT 5+(K+1)/2,20+(L+1)/2: OVER
1;" "
3940 IF S$(K+1,L+1)="█" THEN PRI
NT AT 5+(K+1)/2,20+(L+1)/2: OVER
1;" "
3950 RETURN
4000 REM Poke CHR$
4040 LET A=0: LET B=0: LET C$=CH
R$ CHR: GO SUB 4900
4060 GO SUB 5600: PRINT AT 4,22:
PAPER 7;C$: INVERSE 1;C$: GO SU
B 6000
4200 PRINT AT 14,0: PAPER 6;"
O.K.? yes or no " :
BEEP 0.05,36
4210 IF INKEY$="Y" OR INKEY$=CHR
$ 13 THEN GO TO 1800
4220 IF INKEY$="N" THEN BEEP 0.0
7,28: BEEP 0.07,25: PRINT AT 4,2
2: PAPER 6;" " : GO TO 2200
4230 IF INKEY$="9" THEN GO TO 99
9
4250 GO TO 4201
4920 IF CHR>143 THEN LET X=T+8*(
CODE C$-144): GO TO 4940
4930 IF CHR<128 THEN LET X=5+8*(
CODE C$-32)
4940 LET P=0: FOR I=1 TO 8: FOR
J=1 TO 8: IF S$(I+8,J+8)="█" THE
N LET P=P+A(J)
4950 NEXT J: POKE X+I-1,P: LET P
=0: NEXT I: RETURN
5000 REM TINY
5010 PRINT AT 11,21: PAPER 7;"
"
5020 PLOT 164,89: DRAW 39,0: DRA
W 0,-11: DRAW -39,0: DRAW 0,11
5040 FOR I=1 TO 8: FOR J=1 TO 8:
IF S$(I,J)="█" THEN PLOT 171+J,

```

```

88-I: PLOT INVERSE 1;187+J,88-I
5050 NEXT J: NEXT I: RETURN
5500 GO SUB 5600: PRINT TAB 0; P
APER 7;" !""#%&'()*+,-./0123456
789:;<=>?" : GO SUB 6000: PRINT T
AB 0; PAPER 8;" !""#%&'()*+,-./
0123456789:;<=>?"
5510 GO SUB 5600: PRINT TAB 0; P
APER 7;"@ABCDEFGHIJKLMNPOQRSTUVWXYZ\
Jt " : GO SUB 6000: PRINT TA
B 0; PAPER 8;"@ABCDEFGHIJKLMNPOQ
RSTUVWXYZ\Jt "
5520 GO SUB 5600: PRINT TAB 0; P
APER 7;"fabcd efghijklmnopqrstuvw
xyz\Jt " : GO SUB 6000: PRINT TA
B 0; PAPER 8;"fabcd efghijklmnopq
rstuvwxyz\Jt "
5530 GO SUB 5620: PRINT TAB 0;"
" : PAPER 7;"CDEFGHIJKLMNO
PQRSTU" : PAPER 8;TAB 6;"ABCDEF GH
IJKLMNOPQRSTU"
5590 RETURN
5600 LET J=5-256: POKE 23606,J-2
56*INT (J/256): POKE 23607,INT (
J/256): RETURN
5620 POKE 23675,T-256*INT (T/256
): POKE 23676,INT (T/256)
5622 RETURN
6000 POKE 23606,0: POKE 23607,60
: RETURN
6010 POKE 23606,88: POKE 23607,2
51: RETURN
7000 REM SAVE CHR$
7010 INK 1: PAPER 5: BORDER 5: C
LS
7020 PRINT AT 9,1:"TITLE OF BYTE
S : ENTER= "CHR$""

```

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```

7030 POKE 23624,41: DIM T$(10):
INPUT ;"10 CHR$ max (4=ESC)";U$:
IF U$="4" THEN GO TO 1800
7032 IF U$="" THEN LET T$="" CH
R$ : GO TO 7036
7034 LET T$=U$
7036 FOR I=1 TO 10: IF CODE T$(I
)<>32 AND CODE T$(I)>47 AND CODE
T$(I)<58 THEN GO TO 7010
7038 NEXT I
7044 LET J=65536-S
7050 SAVE T$CODE S,J
7060 LET R=1800: ON ERR GO TO 79
50: PRINT AT 9,0;" "; FLASH
1;"REWIND TAPE TO VERIFY"; FLAS
H 0;" ";AT 11,10;"*****
*****";AT 11,11: PAPER 8; INK 8; O
VER 1;T$
7070 PRINT AT 19,0;; VERIFY ""CO
DE : GO TO 1800
7099 STOP
7100 REM LOAD CHR$
7110 PAPER 2: INK 6: BORDER 2: C
LS
7120 PRINT AT 9,4; FLASH 1;"STAR
T TAPE TO LOAD BYTES"
7130 LET R=1800: ON ERR GO TO 79
50
7140 PRINT AT 16,0;; LOAD ""CODE

7150 GO TO 1800
7199 STOP
7950 PRINT #1;AT 0,7; FLASH 1;"T
APE LOADING ERROR";AT 1,2; FLASH
0;" press any key to continue "
: PAUSE 4E4
7960 ON ERR RESET : GO TO R
8999 STOP
9000 REM CHR$
9005 POKE 23658,8: POKE 23675,88
: POKE 23676,255
9010 CLS : PRINT AT 9,8; FLASH 1
;"DO NOT STOP TAPE"
9020 LOAD ""CODE
9030 GO TO 1800
9998 STOP
9999 PAPER 8: INK 9: PRINT AT 20
,0;; SAVE "CHR$" LINE 9000: SAVE
"CHR$"CODE 64600,936: VERIFY
"CHR$": PRINT AT 20,0;; VERIFY "
CHR$"CODE

```

REVIVING THE 2068 KEYBOARD

continued from page 1

button across the two lines unique to that character on the keyboard.

The major problem with this arrangement is the build up of a resistive corrosion on the contacts of the circuit board. Lessening or remedying the problem is possible without opening your computer. Here are the steps:

- (1) Carefully lift one corner of the keyboard overlay and gently lift off the complete overlay and lay it aside. You will find it stuck down with something akin to contact cement and will lift up without bending if you are careful.
- (2) Unscrew the hard plastic sheet holding the keys in place. Turn the computer over while holding this sheet in place with

your hand. The sheet will come out in your hand with all keys in place. Lay the sheet aside face down so the keys will not get out of place.

(3) Lift off the rubber sheet to reveal the circuit board beneath.

(4) Obtain some color TV tuner contact cleaner from Radio Shack along with some cotton tipped plastic swabs (Q-tips). Scrub each circular contact point on the circuit board giving special attention to the keys which were giving trouble and the space bar contacts.

(5) Reassemble your keyboard. Use contact cement to help re-stick your overlay.

Now try it out. I found that all my "dead" keys but one, and my space bar, had their old life back. Only the "i" key still has a little difficulty contacting.

-- Richard Cravy

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Zebra Talker — A Review

The Zebra Talker is a hardware and software combination that will allow you to synthesize human speech. The system is based around the Votrax SC-01 Speech Synthesizer IC which produces 45 basic speech sounds and links them together to make speech. Approximately 1400 words are able to be created using this device. A phoneme editor and text-to-speech software come with the package.

The hardware portion of the Zebra Talker is basically an I/O port (191) connected to the Votrax speech synthesizer. The interface has it's own power supply so as to not use any of the computer's power. A sound output cable leads away to be connected up to your monitor audio input or some other amplifier (the output is low level and requires some type of amplification). A resistor-capacitor combination acts as an clock oscillator for the synthesizer IC. There is

no on-off switch, power being supplied by plugging in the cable.

The Z Talker comes with the Votrax speech dictionary, so even if you had no software, you could create speech by just OUTing the proper values to port 191 and then use PRINT IN 191. To make this easier, a phoneme editor program is supplied to let you easily "build" your own speech.

The editor lets you build up your words one sound at a time using the Votrax dictionary or your own guessing. After you have built up a word(s), you can print out the sequence of sounds along with the Votrax symbol, the hex and decimal equivalent, and the 2068 character. For example, if you want it to say "computer", you would enter the following sequence of sounds as given in the Votrax dictionary:

k uh1 m p y1 iu u1 t er

Notice the different "vowel" sounds. There are 36 in all. A table containing special vowel-phoneme combinations is also given in the dictionary. This is not new; if you open any good sized dictionary, they will usually have phonetic representations at the bottom of the page. This idea is used here to create speech from a set of common sounds!

The second program contains a text to speech routine that allows you to just type in words and the computer will speak them! This is the best part of the package! Using stream #4, all text is sent to the synthesizer. The machine code can be easily added to your own program at location 59000 and is 6000 bytes long.

The use is very easy and almost completely transparent to the user. All you have to do is enter your text into your programs with PRINT #4 statements. For it to say "computer talks", all you would have to do is enter into your program:

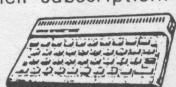
10 PRINT #4;"computer talks"

The text to speech program will handle about 90% of all words entered. The program checks for combinations of letters and creates the proper sequence of sounds

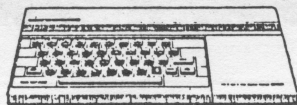
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to produce the spoken word. Due to certain unusual combinations and so many rules in the English language, some words come out pronounced wrong. In the last example, the word "computer" comes out sounding like "compooter". To correct the pronunciation, you need to "fudge" the spelling. To make "computer" sound right you need to enter "compu ter".

The sound from the Z Talker is very intelligible and can be changed in pitch by a simple POKE. There are some sounds it has trouble with though. It has trouble with the "p" sound. It sounds more like a quiet "t" in most instances. But some sounds are perfect like when you have it say "six".

If you really want to change the pitch drastically, you can change capacitor C2 to a higher or lower value and make it range from sounding like Jaba the Hut to Kermit the frog!

I would like to see a nice case for the interface instead of the two pieces of cardboard stuck on each side. Also, I would like to see the power drawn from the computer instead of a separate supply and I wish that they provided a longer audio cable so it would reach the back of my monitor. One last thing, it should have a 2068 wide feedthrough connector so as to add other 2068 interfaces.

Over all, I'm impressed. The construction of the interface, the quality of the programs, even the sound is pretty good. Using the text-to-speech, it's fun to see how well it pronounces all the words you tell it to and to see what happens when you make words up. And remember, it will sound the same no matter what computer it's on.

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-- Joe Williamson

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An Update on Using the Portuguese Disk Drive



As I write this, I have had the Portuguese disk drive system for about 6 weeks. My experience with the system continues to be very positive. The only recurring problem has been a cable that sometimes does not make connection (as in TS-1000 to 16K ram pack problems).

Meanwhile, I am now saving all my Tasword files on disk, and boot Tasword up from it. So far, I have not lost a single file nor has any failed to load. It is truly a hassle-free system in this way. I have not yet tried some of the more advanced features of the operating system since I am not much of a programmer, more of a user of what others do.

Complaints? A few. The power supply can get very hot and definitely must be kept in a well ventilated area. The interface which plugs into the back of my computer and the cable that plugs into the interface add 6" to the depth my computer occupies on my desk. I would much prefer a Tasman or Aerco type interface box and cable connection. And speaking of interfaces, there is no way to hook my Aerco or Tasman interface up without using a rear edge connector extension and a Currah "Micro-Slot" which provides two edge connectors mounted in parallel. Not that these are insurmountable since this issue of SUM is being saved and loaded off the disk drive and printed using a Tasman interface driving our parallel daisy wheel printer.

Here are some more pluses. I have had the chance to test an Amdek 3" disk drive often advertised in computer magazines for the Tandy color computer. It works just like the Hitachi unit which comes with the Portuguese drive system. I am confident that 3 1/2" Sony, 5 1/4" Shugart SA-400 compatible, and even 8" drives can be operated on this system. They are all equipped with the same connector and use the same formatting scheme. Thus a second drive could be added in a more common size with diskettes available everywhere. One could even replace the single drive with a more common size once you found a way to transfer a copy of the operating system to the new diskette.

I understand that the English Micro Connection is accepting orders on the systems. Contact them for more information. SUM Magazine would welcome reviews of the systems being offered by Ramex and Aerco. Anyone owning one of these systems who is willing to provide any kind of review at all may contact SUM. If nothing else, we will call you and interview you over the phone and then write up the essence of the interview. Call us at 904-378-9000 or 462-1086 evenings.

-- Richard Cravy

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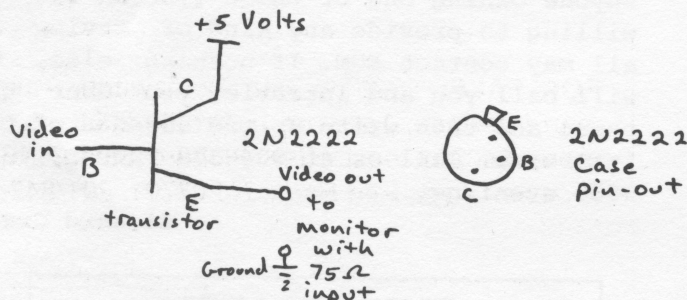
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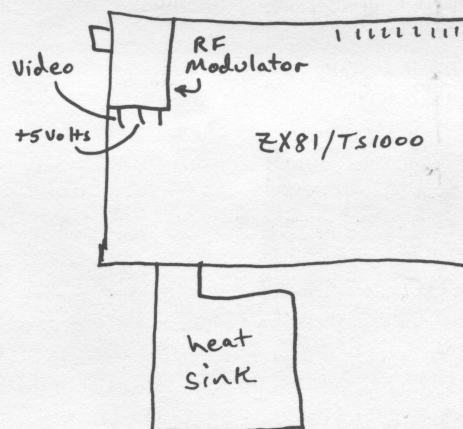
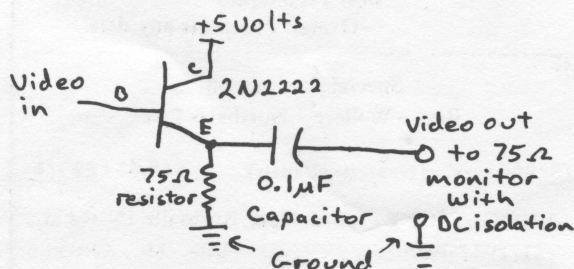
Monitor Output for the TS-1000 & 1500

I have had numerous requests on how to add direct video to the TS-1000 & TS-1500 computers so as to drive a composite video monitor. This has been covered many times in the past in other newsletters and magazines, but I feel that for those who are just now starting to use their computers and those who missed the other articles, here is how to do it.

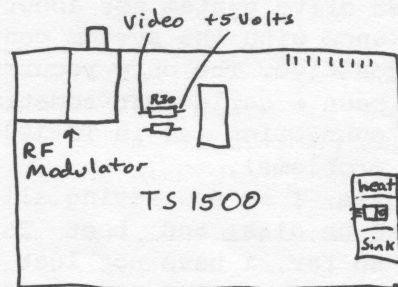
The only way to do it is to go inside the computer and make some extra connections and add extra circuitry. On the two monitors that I have, one works quite well from just tapping the video signal before it goes into the modulator and connect it directly to the monitor (don't forget the ground). This method will work on almost all monitors that have a switchable input impedance -- labeled Hi-Z and 75 ohm. If you connect the video from the computer directly to the input of the monitor, you should use the Hi-Z position.



For monitors that come only with 75 ohm input, you will need to build a small driver circuit to the 75 ohm input of the monitor. This driver circuit can be a simple transistor emitter-follower circuit using the input impedance of the monitor as the load. Here again, a few monitors have a slight DC potential on the input, so some sort of isolation must be used. A 0.1 micro-Farad capacitor will work fine.



The video in the ZX81/TS-1000 can be found on one of the wires leading into the RF modulator. The lead to the left is video (facing from the front) and plus five volts is the center wire (+5 volts is needed for the transistor circuit).



On the TS-1500, the video signal can be found on pin 11 of U1 inside the modulator and +5 volts can be found on pin 8. The video can also be found on the left side of R30 and +5 volts on the right side of R30 (facing the front of the computer). These second two places are easier to get to. As far as adding a connector, I just clipped the existing leads at the RF connector and ran my new circuitry over to the existing connector which gives a cleaner look from the outside, but you will not be able to use a regular TV again.

-- Joe Williamson

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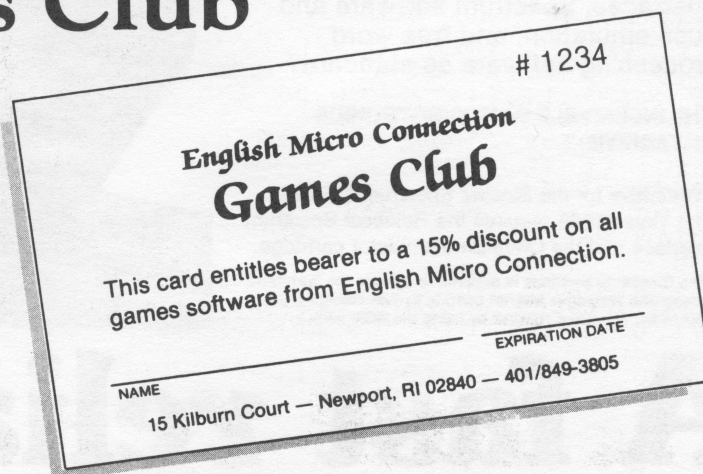
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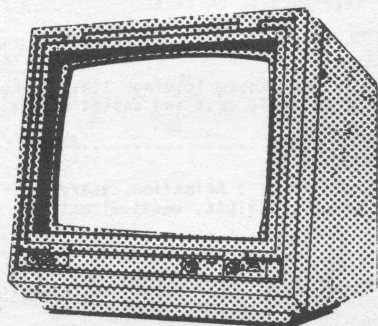
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